

REMARKS

Applicant respectfully requests consideration of the subject application. Claims 1-5, 7, 9-13, 15-23, 25-29, 31-35, 42-43, 45 and 46 are pending. This Response is submitted in response to the Office Action mailed June 27, 2006. In this Amendment, claim 23 has been amended. No new matter has been added.

Objections to the Claims

Claim 23 is objected to because the word "channel" should be changed to the word "conduit." Applicant has amended claim 23 in accordance with the Examiner's suggestion. Applicant, accordingly, respectfully requests withdrawal of the objection to claim 23.

Rejections under 35 U.S.C. § 103

Claims 1-2, 4-5, 7, 9-13, 15-22, 25-29, 42-43, and 45-46 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Downing in view of Mittal, et al. (U.S. Patent No. 4,450,505, hereinafter "Mittal"), claims 10 and 31 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Downing in view of Mittal as applied to claims 1 and 29 above, and further in view of Yamamoto, et al. (U.S. Patent No. 4,729,060, hereinafter "Yamamoto"), Claims 32-35 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Downing in view of Mittal as applied to claims 1 and 29 above, and further in view of Hisano, et al. (U.S. Patent No. 5,198,889, hereinafter "Hisano").

Applicant respectfully submits the cited art fails to teach or suggest, *inter alia*, as claimed in claim 1: “a flexible channel to alternate between a compressed position and an extended position and having a first open end and a second closed end, said first open end coupled with said conduit, said open end having an internal width, said flexible channel comprised of a resilient material having spring-like characteristics, said material to provide a spring-like restoring force when compressed, the second closed end comprising a thermally conductive material attached to said flexible channel, said thermally conductive material having a substantially planar surface to interface directly with said integrated circuit when said flexible channel is extended and to detach from said integrated circuit in said compressed position, said flexible channel being conformable with a non-planar integrated circuit.” A similar limitation is included in independent claim 42.

Downing is directed to a coolant-activated high-intensity cooler for cooling electronic modules. Downing discloses hollow resilient members mounted at the open end of a coolant chamber and having bellows and a heat transfer piece mounted at the ends of the bellows so as to be in direct and resilient contact with electronic components. Downing also discloses a laminated stack of plates arranged with a metal bellows. Downing further discloses that fluid coolant flows through the stack and the metal bellows expand when the coolant is initially pressurized to move the cooler assembly into contact with the electronic module which acts as the heat source. When the coolant circuit is depressurized,

the spring constant in the bellows will cause the assembly to retract from the module allowing servicing or replacement.

Mittal is directed to a multichip thermal conduction module that has improved cooling in a housing. The housing is divided so as to form first and second cooling portions. The chips are in the first cooling portion and several bellows extend into the first cooling portion so that each bellows is urged into deflecting contact with a respective chip.

Downing does not teach or suggest a flexible channel being conformable with a non-planar integrated circuit. Downing discloses that the thermally conductive interface elastomer material interfaces between the bellows and the module so that any surface irregularities on the module or misalignment between the assembly and module are accommodated without impeding the transfer of heat.

In fact, the Examiner admits that Downing does not teach the flexible channel being conformable with a non-planar integrated circuit.

Similarly, Mittal does not teach or suggest a flexible channel being conformable with a non-planar integrated circuit. Mittal specifically discloses: "Board 16 is well known and includes a plurality of integrated circuit chips 30 mounted thereon having a substantially planar surface 32." (Col. 2, lines 31-33). Mittal also discloses: "Chips 30 have their planar surface 32 extending into first cooling portion 36." (Col. 2, lines 42-43). Thus, Mittal specifically teaches away from embodiments of the presently claimed invention.

In contrast, in embodiments of the presently claimed invention, the flexible channel is conformable with non-planar integrated circuits..

Neither Yamamoto nor Hisano disclose a flexible channel that is conformable with non-planar integrated circuits.

In addition, Downing does not disclose that the material of the flexible channel is to provide a spring-like restoring force when compressed. In Downing, the coolant pressure forces the plate stack to move upward and downward to contact the metal plate and also force the bellows and metal end cap to contact the device to be cooled. Mittal also does not disclose the flexible channel having a spring-like restoring force when compressed.

Furthermore, Downing is directed to a system wherein a conduit is connected to the bellows member and plate stack to cool the device, while Mittal is directed to a system wherein a heat conducting plate and heat conducting strands are used to cool the device. The bellows in Mittal is not coupled with a conduit.

In addition, Downing includes a stack of plates disposed within the bellows. The stack of plates needs to be in planar contact with the metal end cap to effectively transfer heat. The bellows of Mittal would not be able to ensure the effective contact of both the plate stack and the metal end cap.

Therefore, neither Downing, Mittal, Yamamoto, Hisano, nor combinations thereof disclose or suggest the claimed limitations of independent claims 1 and 42. Claims 2-5, 7, 9-13, 15-23, 25-29, 31-35, 43, 45 and 46 depend, directly or

indirectly, from one of the foregoing independent claims. Accordingly, Applicant respectfully requests withdrawal of the rejections under § 35 U.S.C. 103.

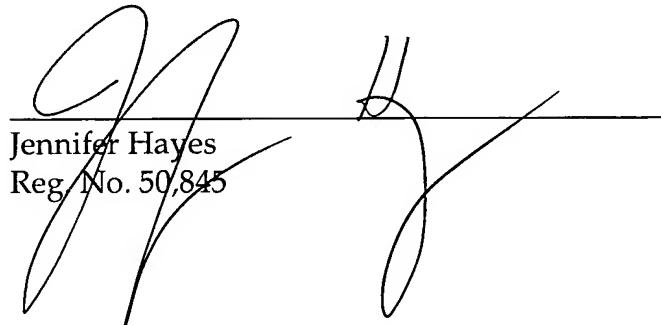
Applicant respectfully submits that the present application is in condition for allowance. If the Examiner believes a telephone conference would expedite or assist in the allowance of the present application, the Examiner is invited to call Jennifer Hayes at (408) 720-8300.

Please charge any shortages and credit any overages to Deposit Account No. 02-2666. Any necessary extension of time for response not already requested is hereby requested. Please charge any corresponding fee to Deposit Account No. 02-2666.

Respectfully submitted,
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Dated: September 27, 2006

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